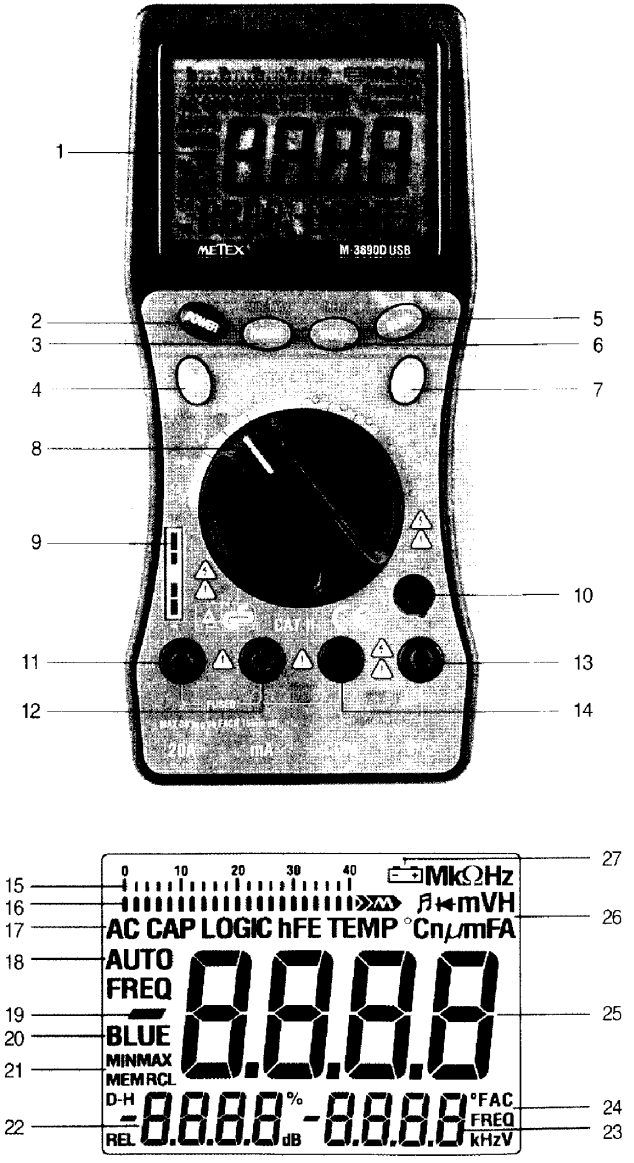
Distributed by:

JAMECO® ELECTRONICS

www.Jameco.com ✦ 1-800-831-4242

The content and copyrights of the attached material are the property of its owner.

Jameco Part Number 215589



1. LCD (3 3/4 digit max. 3999 counts)
2. POWER Button
3. RANGE Button
4. REL Button
5. BLUE Button
6. HOLD Button
7. DC Ω /AC ((•)) Button
8. Rotary Function Selector
9. Capacitance Socket
10. Transistor Socket
11. 20A Terminal
12. mA Terminal
13. V/ Ω Terminal
14. COM Terminal
15. Bargraph Scale
16. Analog Bargraph
17. Range Table Indication Area
18. Auto Range Indicator
19. Negative Polarity
20. BLUE Indicator
21. Advanced Function Indication Area
22. Secondary Sub1 Display
23. Secondary Sub2 Display
24. Secondary Annunciators
25. Main Display
26. Main Annunciators
27. Low Battery Indicator

CONTENTS

1. INTRODUCTION 6

2. SAFETY INFORMATION 6
2-1. Safety Requirements 6
2-2. Environmental Conditions 6
2-3. Safety Symbols 7
2-4. Safety Warnings 8

3. PREPARING FOR OPERATION 9
3-1. Installing the Battery 9
3-2. Using the Test Leads 11

4. PRE-OPERATION CHECK 12

5. HOW TO USE THE METER 12
5-1. Push Buttons 12
5-2. Input Sockets 13
5-3. Function Selector Rotary Switch 14
5-4. Input Terminals 15
5-5. Digital and Bargraph Display 16
5-6. Automatic Power off 17
5-7. Using the Advanced Function 17
5-8. Annunciators 21

6. HOW TO MAKE MEASUREMENTS 23
6-1. Measuring DC/AC Voltage 23
6-2. Measuring Frequency 25
6-3. Measuring Resistance 27
6-4. Testing Continuity 28
6-5. Checking Diode 29
6-6. Measuring Capacitance 30
6-7. Checking Transistor 32
6-8. Measuring Current 33
6-9. Measuring Temperature 35

7. USING THE METER WITH COMPUTER 36
7-1. Installing the Device Driver 36
7-2. Installing and Using the Application Program 37

8. CARE AND MAINTENANCE 41
8-1. Replacing the Fuse 41
8-2. General Maintenance 42

9. SPECIFICATIONS 43
9-1. General Characteristics 43
9-2. Special Characteristics 44

Due to our policy to refine the products continuously, this manual may contain minor differences in specification, components, parts and circuit design of the instrument actually delivered.

1. INTRODUCTION

With this Digital Multimeter, you have acquired a high-quality, powerful performance, heavy-duty rugged and handheld multimeter that will give you confidence and peace of mind in your every measuring job.
Please read this operating instruction very carefully before commencing your measurements.

2. SAFETY INFORMATION

2-1. Safety Requirements

This meter has been manufactured and tested in accordance with IEC1010-1/EN61010-1.
Part1 : Safety Requirements for Electrical Equipment for measurement, control and laboratory use, Safety Class II, Overvoltage Category II.
This manual contains information and warning which must be observed to assure safe operation and maintain the meter in safe condition.

2-2. Environmental Conditions

This part applies to your multimeter designed to be safe at least under the following conditions.

Indoor use :
- Altitude up to 2000m
- Temperature 0℃ to 40℃
- Maximum relative humidity 80% for temperature up to 31℃ decreasing linearity to 50%
- Relative humidity at 40℃
- Pollution degree 2

2-3. Safety Symbols

The following symbols have been placed on the meter to remind you of measurement limitation and safety.

The maximum current that you can measure at this terminal is 20A DC/AC. This terminal is fuse protected by FF 250V/15A fast blow fuse. When using this range with high current, keep the duty cycle to 30 seconds on load, 15 minutes off load.

The maximum current that you can measure at this terminal is 400mA DC/AC. This terminal is fuse protected by a 400mA poly switch fuse.

To avoid electric shock or instrument damage, do not connect the common 500V input terminal COM to any source of more than 500 volts with respect to earth/ground.

The maximum voltage that you can measure at this terminal can measure is 1000V DC or 750V AC.

Be exceptionally careful when measuring high voltage. DO NOT TOUCH THE TERMINALS OR PROBE ENDS.

Refer to the complete operating instructions.

Indicates protection class II, double insulation.

CAT II Overvoltage Category II.

⎓ Direct and Alternating current.

NOT FOR HIGH ENERGY INDUSTRIAL USE.

2-4. Safety Warnings

- To prevent electric shock hazard and damage to the meter, do not attempt to measure voltage exceeding 1000V DC or 750V AC.
- To avoid damage to the meter and body injury, observe the input limits as stated in Table 1.
- To avoid damage to the meter, disconnect the test leads from test points before changing the function or range.
- To avoid electric shock, be careful when working above 35V DC/25V AC. Such voltage poses a shock hazard.
- The 20A range is fuse protected. To avoid damage or injury, use the meter only in circuits limited by fuse or circuit breaker to 20A or 4000VA.
- Do not apply voltage to 20A or mA and COM terminal at the same time.
- Do not get the meter and test leads wet.
- Ensure the test leads are in good condition.

Table 1. INPUT LIMITS

FUNCTION	TERMINAL	INPUT LIMIT
V DC	V/Ω + COM	1000V DC
V AC	V/Ω + COM	750V AC
Ω / (•))	V/Ω + COM	250V DC/AC
mA	mA + COM	400mA/250V
20A	20A + COM	20A/250V
Capacitance	Cap. Socket	Less than 25V RMS or 30V DC
Frequency	V/Ω + COM	250V DC/AC
Diode	V/Ω + COM	250V DC/AC
Logic	V/Ω + COM	250V DC/AC
Temperature	Temp. Socket	Less than 25V RMS or 30V DC

3. PREPARING FOR OPERATION

3-1. Installing the Battery

Your meter requires a 9V battery for power. The symbol " ⊟+ " appears when the battery voltage drops to certain limits. For proper operation, replace the battery as soon as possible. Continued use with a low battery will lead to an abnormal reading.

WARNING : TO AVOID ELECTRIC SHOCK, DISCONNECT BOTH TEST LEADS FROM THE METER BEFORE YOU REMOVE OR INSTALL THE BATTERY.

Follow these steps to install the battery.

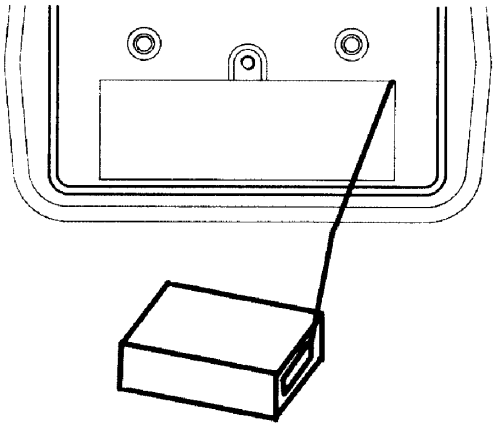
1. Turn off the power and disconnect the two test leads from the meter.

2. Remove the screw to open the battery compartment.

3. Place the battery into the insulation capsule and snap it onto the contacts.

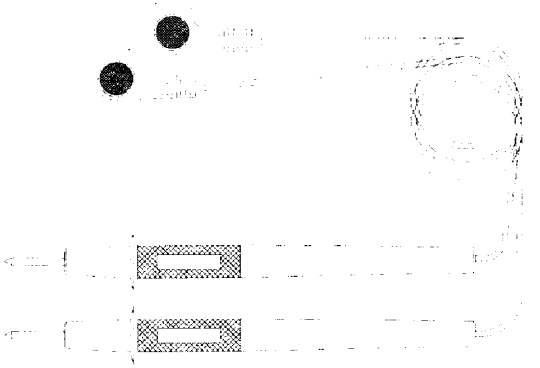
WARNING : DO NOT DISCARD THE PROVIDED BATTERY INSULATION CAPSULE. IF YOU DO NOT USE THIS INSULATION CAPSULE PROPERLY, IT MIGHT CAUSE DAMAGE OR INJURY.

4. Replace the battery compartment cover and secure it with screw.



3-2. Using the Test Leads

Use only the type of test leads supplied with your meter. These test leads are rated for 1200 volts.



CAUTION :

- Although the supplied test leads are rated for 1200 volts, the maximum input voltage to your meter can measure is 1000V DC or 750V AC. If you try to measure DC voltage above 1000V or AC voltage above 750V, you might damage your meter and expose yourself to a serious shock hazard. Use extreme care when you measure such high voltage.

- Never connect the probe you plug into the COM terminal to a source of voltage greater than 500 volts with respect to earth/ground. This creates a serious shock hazard.

4. PRE-OPERATION CHECK

To ensure correct operation and familiarize yourself with the meter, follow these steps before using the meter.

1. Push the POWER button.

2. To select a function, turn the rotary switch to the appropriate switch position at your desire. The meter is ready for normal operation.

3. To select an additional operation, press the appropriate push buttons above the rotary switch.

5. HOW TO USE THE METER

This section describes your meter and how to use it.

5-1. Push Buttons

This section describes how to use the push buttons. These buttons are used in conjunction with the rotary switch to select operating modes. When a push button is pushed, the beeper sounds. An annunciator is displayed to indicate that a mode or function has been selected. A quick way to reset all the push buttons to their default state is to turn the rotary switch to an adjacent function and then back to the function you are using.

POWER :
- Press to turn the meter on/off.

HOLD :
- Press to operate Data Hold function.
- Press with BLUE to operate Memory function.
- Press to set an automatic power off time.

REL :
- Press to operate Relative Offset function.
- Press with BLUE to operate Recall function

RANGE :
- Press to operate Range Hold function.
- Press with BLUE to operate Minimum/Maximum Hold function.

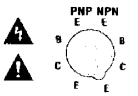
BLUE :
- Press to operate Memory, Recall and Minimum/Maximum Hold function with HOLD, REL and RANGE button.
- Press to set/reset the logic state in Logic range.
- Press to scroll the output frequency step in Signal Out range.
- Press to select an automatic power off time.

DC Ω/AC (((•))) :
- Press "DC Ω/AC (((•))) " button to toggle between DC and AC when the rotary switch is set to Voltage or Current, or between Resistance and Continuity when the rotary switch is set to Ω (((•))) position.

5-2. Input Sockets

This section describes the input sockets.

Transistor Socket



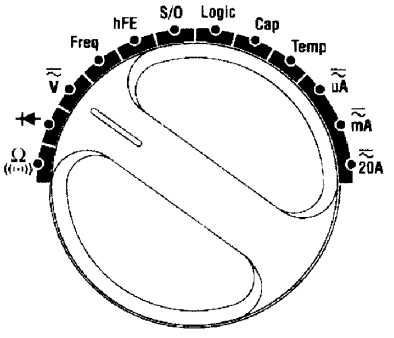
Insert the base, collector and emitter pins into the correct sockets, as marked.

Capacitor & Temperature Socket

In case of the capacitance range, insert a discharged capacitor into the outermost connections observing the correct polarity if required.
In case of the temperature range, insert a K-type thermocouple into the innermost connections.

5-3. Function Selector Rotary Switch

This section describes functions that are selected by setting the rotary switch.

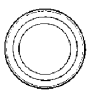


① Ω (•-•) : Resistance/Continuity
② ⊣◀ : Diode Test
③ ≂V : Volts DC/AC
④ Freq : Frequency
⑤ hFE : Transistor Test
⑥ S/O : Signal Out
⑦ Logic : Logic Test
⑧ Cap : Capacitance
⑨ Temp : Temperature
⑩ uA≂ : Microampere DC/AC
⑪ mA≂ : Milliampere DC/AC
⑫ 20A≂ : Ampere DC/AC

5-4. Input Terminals

This section describes the input terminals. (See table 1 (page 9) for input limits.)

20A Amperes Input Terminal



For current measurements (DC or AC) up to 20A the function rotary switch is set to 20A position. When measuring with high current over 12amps, keep the duty cycle to 30 seconds on load.

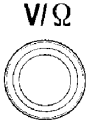
mA Milliamperes Input Terminal

For current measurements (DC or AC) up to 4mA or 400mA the function rotary switch is set to uA or mA position.

COM Common Terminal

Return terminal for all measurements except temperature, S/O, capacitance and transistor test.

V/ Ω Voltage/ohm Input Terminal



For measurements of volts, resistance, continuity, diode and frequency.

5-5. Digital and Bargraph Display

This section describes the digital and bargraph display.

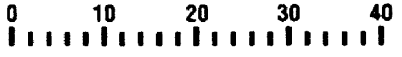
Digital Display

Digital readings are displayed on 4000 counts display with automatic polarity indication and decimal point placement.

Analog Bargraph

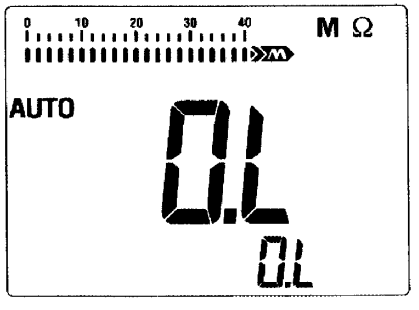
The bargraph consists of 20 segments that illuminate from left to right as the input increase. It functions much the same as the needle on an analog meter without the mechanical overshoot inherent in needle movements. If the input equals or exceeds 4000 counts on the range selected, OL is displayed with flashing the bargraph and beeping.

Bargraph Scale



Scale for absolute readings.

Overload Indication



OL is displayed with flashing the bargraph and beeping when input is too excessive to display. If the initial value of the range is OL, it does not beep.

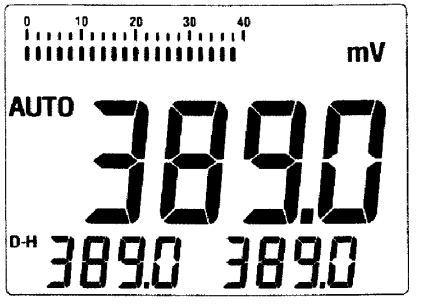
5-6. Automatic Power off

Automatic power off extends the life of the battery by turning the meter off if neither the rotary switch nor a push button is operated for selecting time.
Press "BLUE" button and turn on the meter for the automatic power off time selection. Repeatedly press "BLUE" button and select an automatic power off time (15, 30, 60 minutes or no automatic power off). And press "HOLD" button to set the automatic power off time.

5-7. Using the Advanced Function

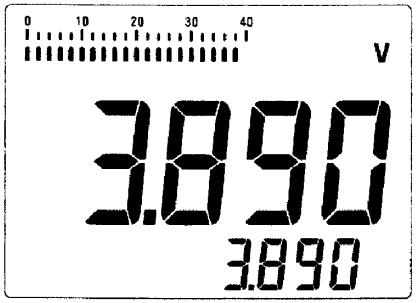
This section describes the advanced functions.

HOLD **Data Hold**



The Data Hold function lets you hold a reading on the secondary display.
To turn on the Data Hold function, press "HOLD" button. Then "D-H" segment is turned on and the hold data is displayed on the sub1 display.
To return to the normal display, press again "HOLD" button or other buttons ("RANGE," "BLUE", "REL").

RANGE **Range Hold**

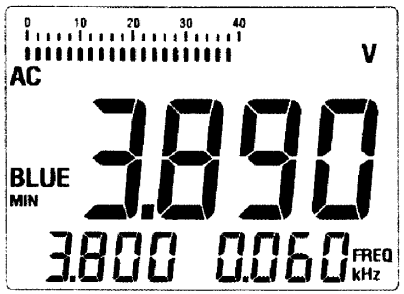


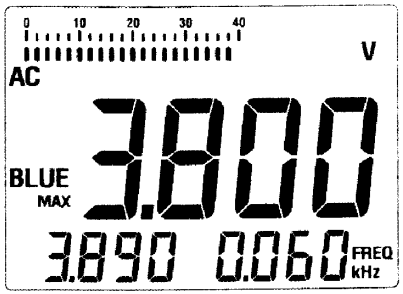
The Range Hold feature lets you set the meter from auto range to manual range mode.

To turn on the Range Hold function, press "RANGE" button. Then "AUTO" segment is turned off and the Range Hold data is displayed on the main display. Range can be changed by repeatedly pressing "RANGE" button.

To return to the normal display, press "RANGE" button for 2 seconds or other buttons ("HOLD", "BLUE", "REL").

BLUE + RANGE **Minimum/Maximum Hold**



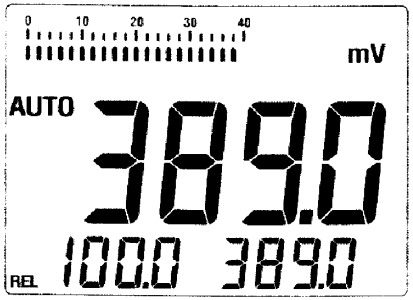


The Minimum/Maximum Hold function lets you measure the minimum/maximum value of a changing reading.

To turn on the Minimum/Maximum Hold function, first press "BLUE" button. Then "BLUE" segment is turned on. And repeatedly press "RANGE" button. Then function is entered to MIN/MAX/Normal Status. Because of automatical ranging hold, "AUTO" segment is turned off and "MIN"/"MAX" segment is turned on.

To return to the normal display, press other buttons ("HOLD", "BLUE", "REL").

REL **Relative Offset**

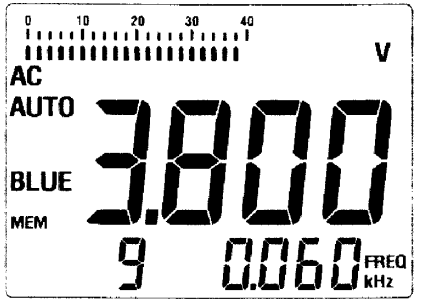


The Relative Offset function lets you measure relative values to a reference value that you set.

To turn on the Relative Offset function, press "REL" button. Then the main value is the reference value of relative offset and the relative offset value is displayed on sub1 display (Relative Offset = Main Value - Reference Value).

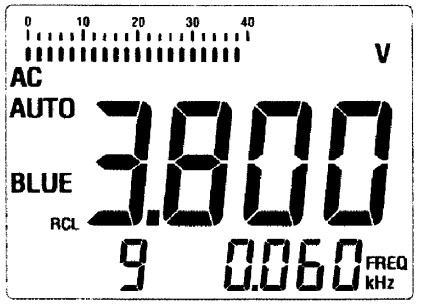
To return to the normal display, press again "REL" button or other buttons ("RANGE", "HOLD", "BLUE").

BLUE + HOLD **Memory**



The Memory function lets you save the measured data.
To operate the Memory function, first press "BLUE" button and "HOLD" button when displayed the saved data. There are 10 memory addresses. And it can be changed by repeatedly pressing "HOLD" button.
To return to the normal display, press "RANGE", "BLUE" or "REL" button.

BLUE + REL **Recall**



The Recall function lets you load the saved data.
To operate the Recall function, first press "BLUE" button and "REL" button. And the saved data is loaded by pressing repeatedly "REL" button.
To return to the normal display, press "RANGE", "BLUE" or "REL" button.

5-8. Annunciators

This section describes annunciators that indicate the mode or state in which the meter is operating.

AUTO (Auto Range)
The measurement range is automatically changed by input value.

AC (Alternating Voltage or Current)
Enables you to measure the AC voltage or current.

CAP (Capacitance)
Lets you to measure capacitance from 4/40/400nF to 4/40/200uF.

LOGIC (Logic Test)
Enables you to test the logic state.

hFE (Transistor Test)
Enables you to measure the hFE value.

TEMP (Temperature)
Lets you to measure Celsius(℃) and Fahrenheit(℉) at the same time.

FREQ (Frequency Count Mode)
Your meter readouts the measured frequency of up to 4MHz.

▬ (Negative Polarity)
Automatically indicates negative input.

BULE (BLUE Mode)
Enables you to operate MEM, RCL and MIN/MAX Hold function.

((•)) (Continuity Check)
Make it easy to check wiring, continuity of cables, fuses and connection, etc.

⊣◀ (Diode Test)
The value displayed is the forward voltage of semiconductor function at approximately 1.5mA test current. Single 0 - 2.0V range.

[ ] (Low Battery)
Your meter is operated by a single 9V battery. When this symbol is displayed, replace the battery to avoid errors in reading.

Secondary Display

Allows secondary display readings being displayed independently of the main display.

Unit Annunciators

mV : Millivolts ($1x10^{-3}$ volts)
V : Volts
kHz : Kilohertz ($1x10^{3}$ cycles)
MHz : Megahertz ($1x10^{6}$ cycles)
uF : Microfarad ($1x10^{-6}$ farad)
nF : Nanofarad ($1x10^{-9}$ farad)
A : Ampere (amps.)
mA : Milliampere ($1x10^{-3}$ amps.)
uA : Microampere ($1x10^{-6}$ amps.)
Ω : Ohm
kΩ : Kilohm ($1x10^{3}$ Ω)
MΩ : Megaohm ($1x10^{6}$ Ω)
℃ : Celsius
℉ : Fahrenheit
dB : Decibel

6. HOW TO MAKE MEASUREMENTS

This section discusses some common applications for your meter and alerts you to some considerations to keep in mind when making measurements.

6-1. Measuring DC/AC Voltage

WARNING : DO NOT TRY TO MEASURE A VOLTAGE GREATER THAN 1000 VOLTS DC OR 750 VOLTS AC. DOING SO, YOU MIGHT DAMAGE YOUR METER AND EXOSE YOURSELF TO A SEVERE SHOCK HAZARD.

Follow these steps to measure DC/AC voltage.

1. Rotate the function selector to the desired volt position.

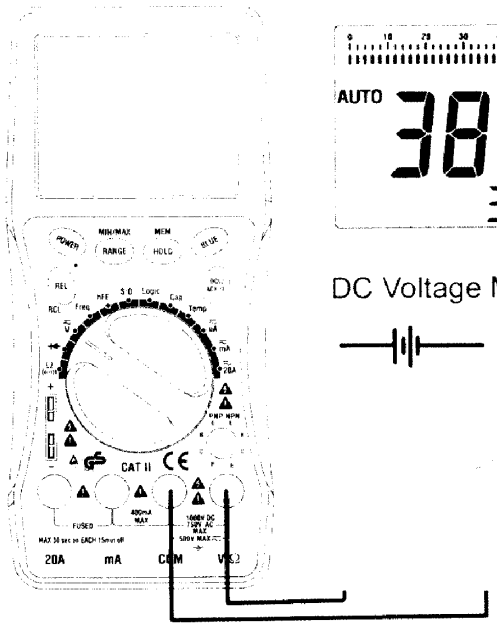
2. Press "DC Ω/AC ((•))" button to toggle between DC and AC. AC appears for AC measurement.

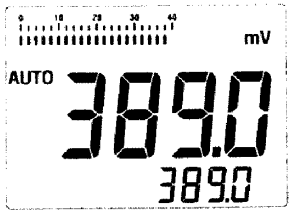
3. Plug the black probe into the COM terminal and the red probe into the V/Ω terminal.

4. Connect the probes to the DC or AC voltage source you want to measure.

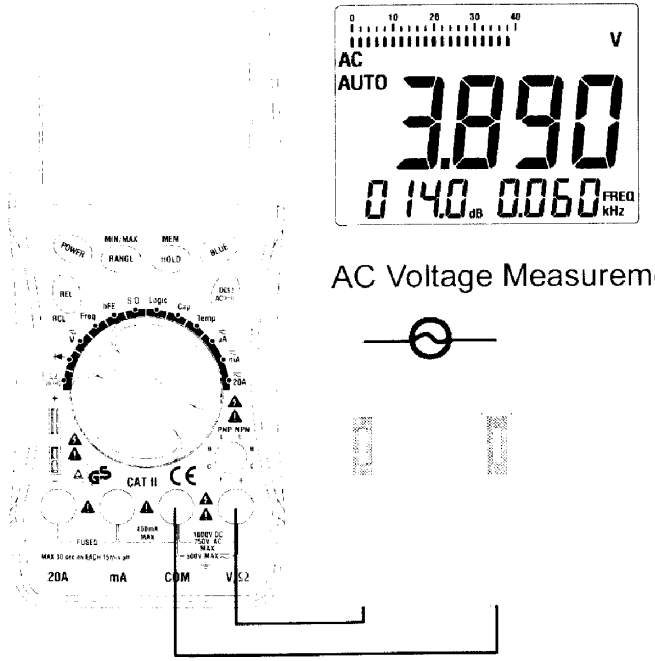
NOTE :

- If polarity is negative, appears on the left of the display.
- Each of the DC or AC voltage range presents an input impedance of approximately 10M Ω in parallel with less than 100pF. AC voltage is AC coupled to the 100M Ω input.
- The meter' s high input sensitivity produces wandering effect when the test leads are not connected to any circuit being measured. This is normal and accurate reading will be appeared when you connect the test leads to a circuit.





DC Voltage Measurement



AC Voltage Measurement

6-2. Measuring Frequency

When you first turn on the meter at frequency position, your meter will directly display the frequency on the main display and AC voltage on the secondary sub2 display.

WARNING : IF YOU TRY TO MEASURE THE FREQUENCY OF A SIGNAL THAT EXCEEDS 250 VOLTS AC RMS, YOU MIGHT DAMAGE YOUR METER AND EXPOSE YOURSELF TO A SEVERE SHOCK HAZARD.

Follow these steps to measure the frequency of a signal.

1. Rotate the function selector to **Freq** position.

2. Plug the test leads into COM and V/Ω terminal.

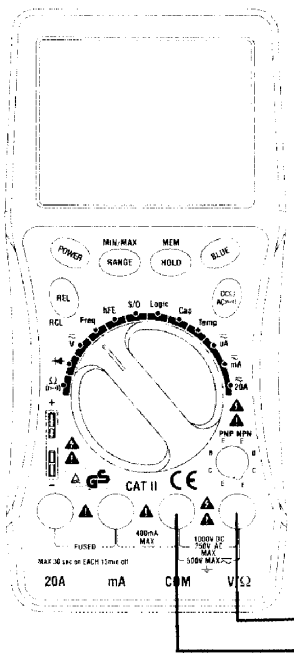
3. Connect the test leads to the frequency source.
   - Input Sensitivity : 360mV up to 4MHz.

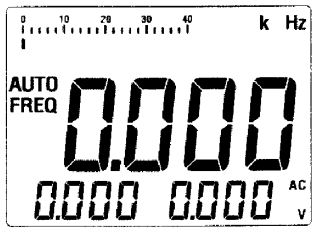
NOTE :

- When the test leads are connected to an AC outlet, do not turn the function selector switch to another range. It might damage the internal components or expose yourself to a severe shock hazard.

- Overload Protection : 250V DC/AC RMS.

- For the most accurate measurements, we strongly recommend you to use the type of BNC cable.





Frequency Measurement

6-3. Measuring Resistance

WARNING : NEVER CONNECT THE TEST LEADS TO A SOURCE OF VOLTAGE WHEN YOU HAVE SELECTED THE OHMS FUNCTION AND PLUGGED THE LEADS INTO THE V/Ω TERMINAL.
BE SURE THAT THE CIRCUIT UNDER TEST HAS ALL POWER REMOVED AND THAT ANY ASSOSICATED CAPACITORS ARE FULLY DISCHARGED BEFORE MAKING A RESISTANCE MEASUREMENT.

Follow these steps to measure resistance.

1. Rotate the function selector to Ω (•••) position.

2. Press "DC Ω/AC (•••)" button to toggle between resistance and continuity.

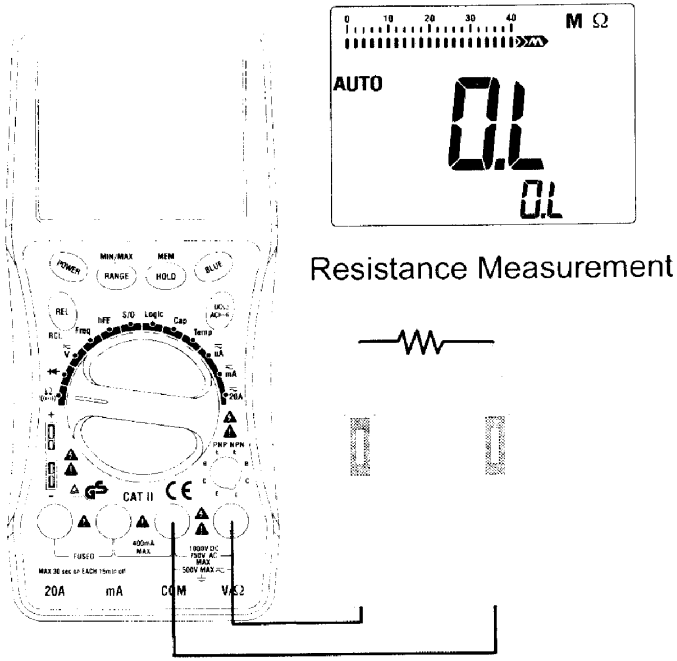
3. Connect the test leads to the device you want to measure.

NOTE :

- The resistance in the test leads can diminish the accuracy on the lowest range (400Ω). The error is usually 1 to 0.2 ohm for a standard pair of test leads. To determine the error, short the test leads together and read the resistance of the leads.

- When measuring resistance, be sure that the contact between the test leads and the circuit is good, dirt, oil, solder flux or other foreign matter seriously affects the resistance.

- If the measured resistance value exceeds the maximum value, OL displays to indicate overload and the bargraph flashes. For resistance of approximately 4 MΩ and above, the display might take a few seconds to stabilize. This is normal for high resistance readings.



Resistance Measurement

6-4. Testing Continuity

Testing continuity verifies that circuit connections are intact.

Follow these steps to perform audible continuity test.

1. Rotate the function selector to Ω (•)) position.

2. Press "DC Ω/AC (•)) " button to toggle between resistance and continuity.

3. Remove power from the circuit.

4. Connect the probes to the circuit.

WARNING : NEVER PERFORM A CONTINUITY MEASUREMENT ON A CIRCUIT THAT HAS POWER CONNECTED.

NOTE :

- THE BUZZER SOUNDS IF THE MEASURED RESISTANCE IS BELOW 80 Ω .

6-5. Checking Diode

This function lets you check diodes and other semiconductors for opens and shorts. It also lets you determine the forward voltage for diodes. You can use this function when you need to match diodes.

Follow these steps to check diode.

1. Rotate the function selector to ⊣◀ position.

2. Plug the test leads into the COM and V/ Ω terminals.

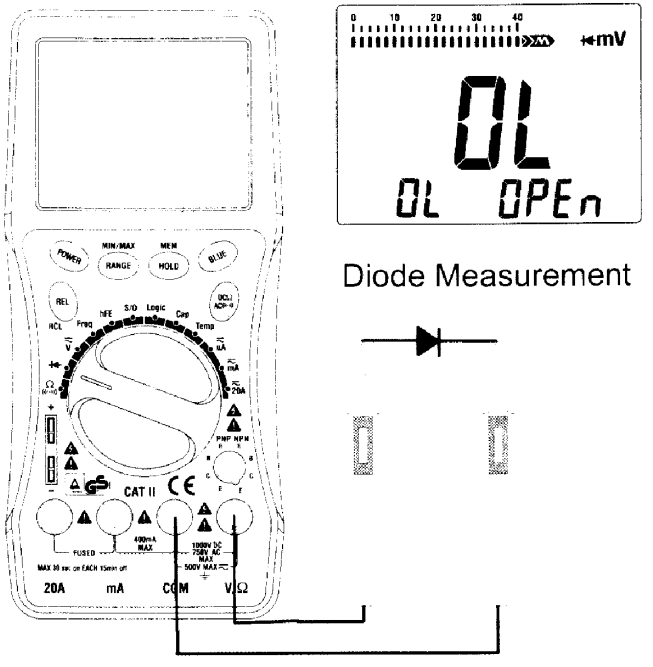
3. Connect the test leads to the diode you want to check and note the meter' s reading.

NOTE :

- If the display shows value, for example, 0.2 for a germanium diode or 0.5 for a silicon diode, reverse the diode. If the meter indicates an overvoltage, the diode is good. The displayed number is the diode' s actual forward voltage.

- If the display indicates an overrange condition, reverse the polarity of the connection. If the display shows a value, the device is good. The displayed value is the component' s actual forward voltage (up to 2.0 volts). If the display still indicates an overrange condition, the device is open.

- If the display shows a value both before and after you reverse the polarity, the device is shorted. When you connect the diode to the meter and the meter displays the device' s forward voltage, the red test lead or socket is connected to the diode' s anode, the black test lead or socket is connected to the diode' s cathode. This meter supplies enough forward voltage to light most LEDs. However, if the LED' s forward voltage is greater than 2.0 volts, the meter incorrectly indicates that the device is open.



Diode Measurement

6-6. Measuring Capacitance

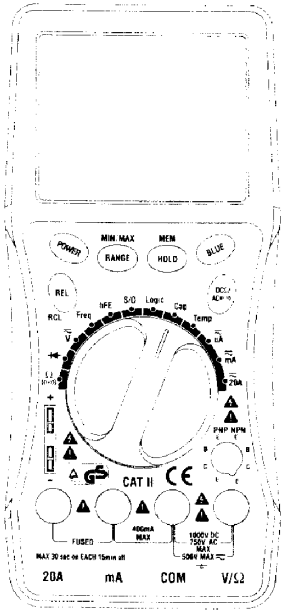
Follow these steps to measure normal capacitance.

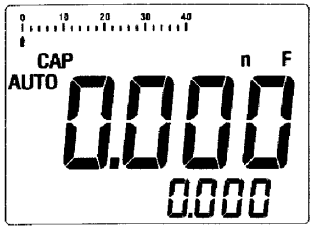
1. Discharge each capacitor before testing by shorting its leads together. Use caution when handling some capacitors as they can hold the considerable electricity.

2. Rotate the function selector to **Cap** position.

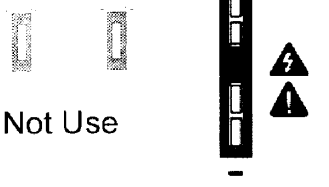
3. Insert the discharged capacitor into the CAP + and - clips. Your meter displays the capacitance value. For polarized capacitors, be sure to insert the negative lead in the - clip.

CAUTION :
If you try to measure the capacitance of a charged capacitor, you might damage your meter and expose yourself to a severe shock hazard.





Capacitance Measurement



Not Use

6-7. Checking Transistor

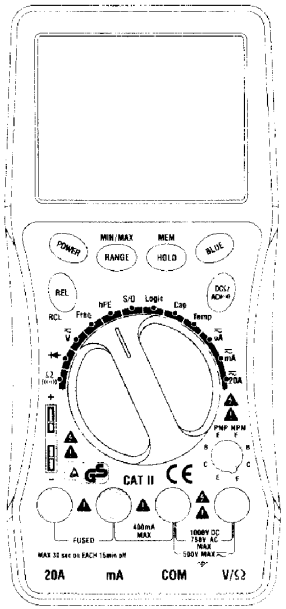
Follow these steps to determine the transistor' s base gain.

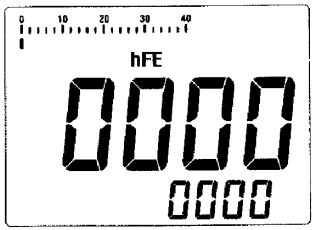
1. Rotate the function selector to hFE.
2. Insert the transistor you want to measure into the appropriate transistor socket. Your meter displays the transistor' s hFE value.

WARNING : THE TRANSISTOR SOCKET IS NOT PROTECTED AGAINST OVERLOAD. YOU CAN DAMAGE THE METER AND VOID YOUR WARRANTY IF YOU BUILD AND EXTERNAL LEADS FOR THE TRANSISTOR SOCKET.

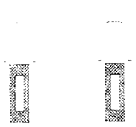
NOTE :

- Insert the base, collector and emitter pins into the correct socket as marked.

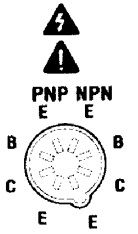




Transistor Measurement



Not Use



- Some darlington transistor contain internal resistors because the meter uses two current readings to calculate hFE, any internal transistor resistance causes unreliable readings.

- Do not take the hFE reading as an absolute measurement value, but rather as an indication that the transistor is under operation. The true gain of a transistor is its operating current. This meter applies up to 1000uA to the emitter and collector, and measures the collector current to calculate the hFE.

- You can not measure the hFE of a transistor that is connected in a circuit.

- You can not measure the hFE of a FET or other non-bipolar transistor.
- High-voltage junctions in power transistors prevent correct readings. Also, the large leads of the power transistor can damage the test socket.

6-8. Measuring Current

Follow these steps to measure current.

1. Rotate the rotary switch to the desired ampere position.

2. Press button to toggle between DC and AC ampere.

3. Connect the meter in series with the load or circuit under test.

WARNING : YOU MIGHT DAMAGE THE METER OR BE INJURED IF THE FUSE BOLWS WHILE CURRENT IS BEING MEASURED IN A CIRCUIT VOLTAGE GREATER THAN 250V. THE 20A TERMINAL IS FUSE PROTECTED. A SEVERE FIRE HAZARD AND SHORT CIRCUIT DANGER EXISTS IF YOU APPLY A

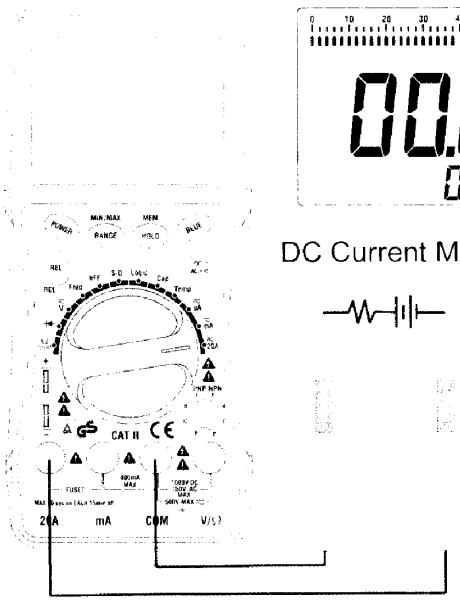
VOLTAGE WITH HIGH-VOLTAGE WITH HIGH-CURRENT CAPABILITY TO THIS TERMINAL. THE METER CAN BE DESTROYED UNDER SUCH CONDITIONS.

NOTE :

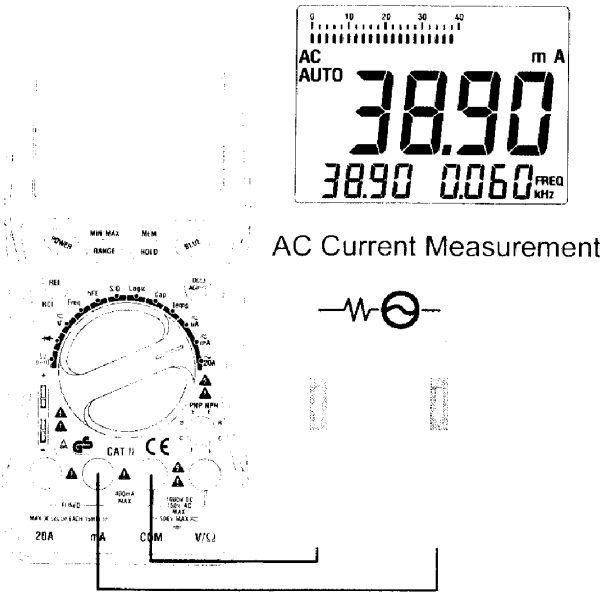
- If you do not know approximately what the current being measured is, connect the circuit to 20A input terminal first to see if you have a safe level for mA input terminal.
  Use the mA terminal input terminal for ampere up to 400mA.

- When measuring ampere, the meter' s internal shunt resistors develop a voltage across the meter' s terminal called "burden voltage". This voltage drop is very low in your meter, but it may affect precision circuits or measurements.

- If you set the meter for DC ampere, ▬ appears or disappears to indicate the polarity of the measured current.



DC Current Measurement

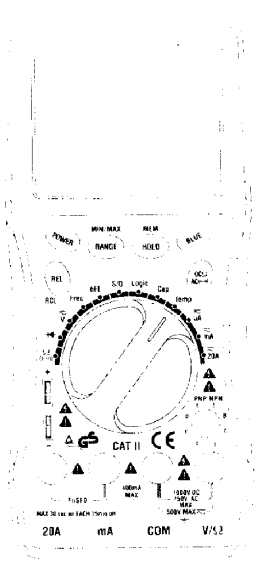


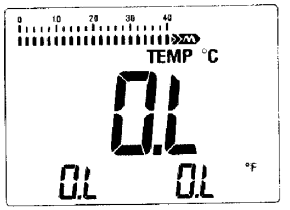
AC Current Measurement

6-9. Measuring Temperature

Follow these steps to measure temperature.

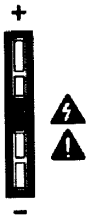
1. Rotate the function selector to **Temp** position.
2. Insert a K-type thermocouple into the innermost temperature socket.





Temperature Measurement

Not Use



7. USING THE METER WITH COMPUTER

7-1. Installing the Device Driver

When you connect the USB cable between the meter' s and the computer' s USB port, your meter is automatically detected and installed by computer. Follow these steps to check the correct detection and installation.

1. Click [Start], point to [Settings], and then click [Control Panel].
2. In [Control Panel], double-click [System].
3. Click the [Device Manager] tab.
4. Find Human Interface Device(HID).

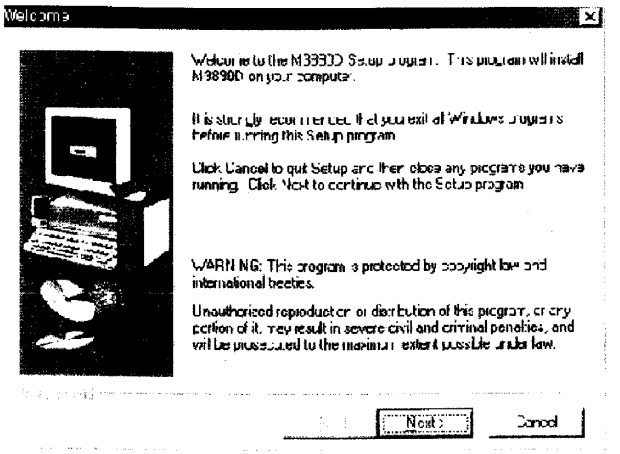
If you find [New Device Detected] when connect the USB cable, follow these steps to manually install your meter.

1. Click [Next] on [Add New Hardware Wizard].
2. Click [Next] and choose [Display a list of all the drivers...].
3. Insert the installation disk to the floppy disk.
4. Click [Next] and then click [Have Disk...].
5. Select the floppy disk and click [OK].
6. Click [Next] and then click [Finish].
7. Reboot your computer to apply new system configuration.

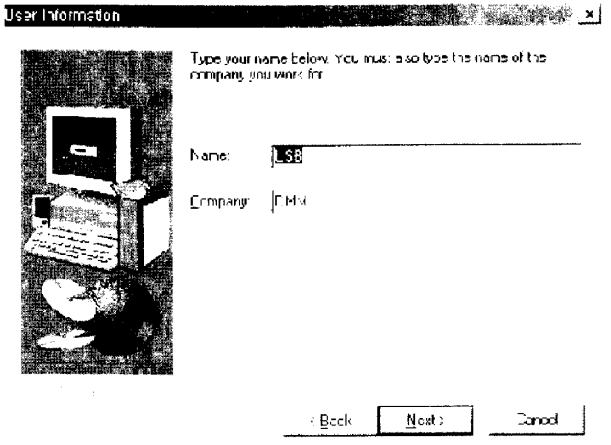
7-2. Installing and Using the Application Program

Follow these steps to install the application program.

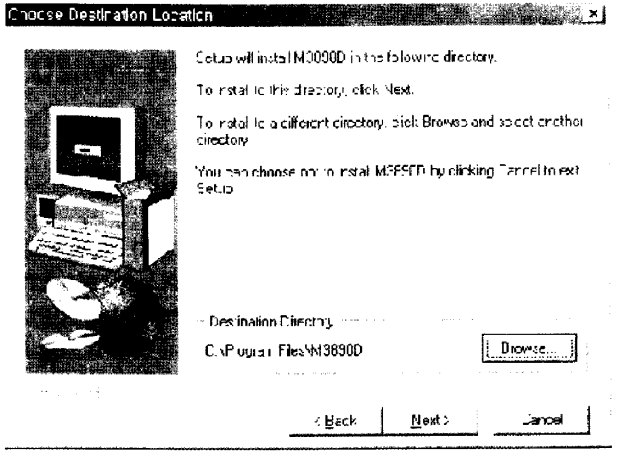
1. Insert the installation disk to the floppy disk.
2. Double-click [My Computer].
3. Double-click [3.5 Floppy (A:)].
4. Double-click setup.exe file.
5. Click [Next].


Welcome
Welcome to the M3890D Setup Program. This program will install M3890D on your computer.
It is strongly recommended that you exit all Windows programs before running this Setup program.
Click Cancel to quit Setup and then close any programs you have running. Click Next to continue with the Setup program.
WARNING: This program is protected by copyright law and international treaties.
Unauthorized reproduction or distribution of this program, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under law.
Next >
Cancel

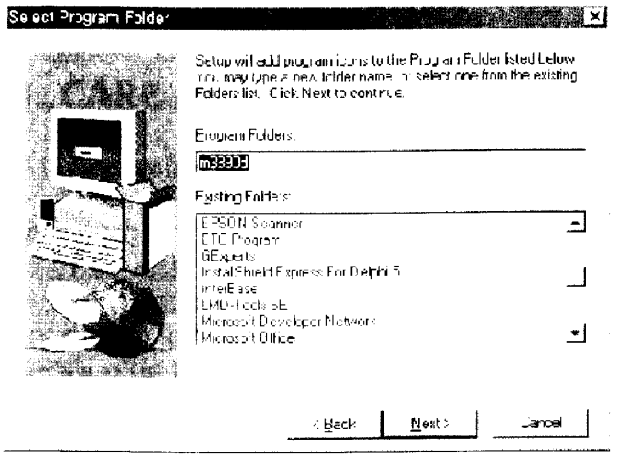
6. Click [Next].



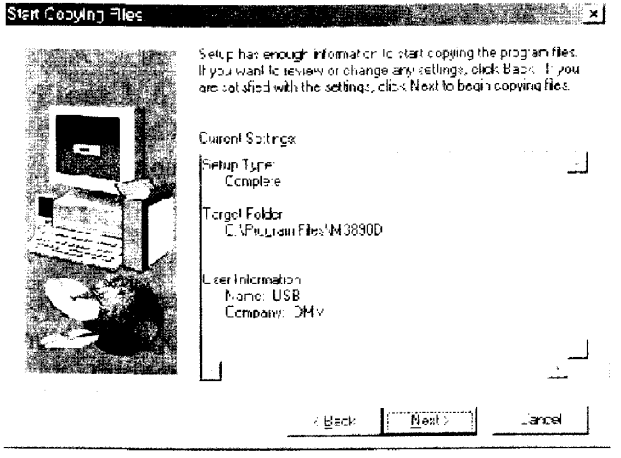
7. Click [Next].


Choose Destination Location
Setup will install M3890D in the following directory.
To install to this directory, click Next.
To install to a different directory, click Browse and select another directory.
You can choose not to install M3890D by clicking Cancel to exit Setup.
Destination Directory
C:\Program Files\M3890D
Browse...
< Back
Next >
Cancel

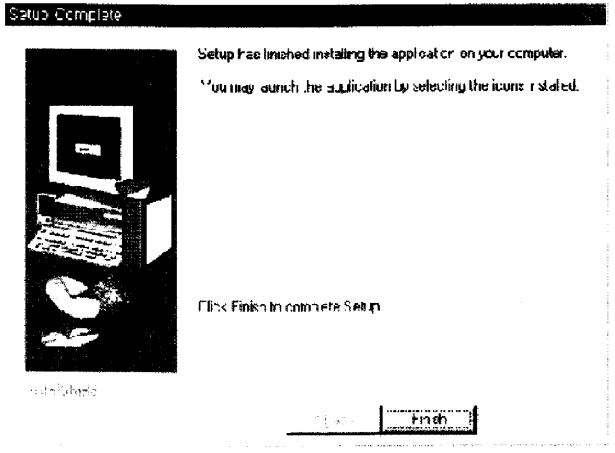
8. Click [Next].


Select Program Folder
Setup will add program icons to the Program Folder listed below. You may type a new folder name, or select one from the existing Folders list. Click Next to continue.
Program Folders:
M3890D
Existing Folders:
EPSON Scanner
ETC Program
GExperts
InstallShield Express For Delphi 5
InterBase
LMD-Tools SE
Microsoft Developer Network
Microsoft Office
< Back
Next >
Cancel

9. Click [Next].


Start Copying Files
Setup has enough information to start copying the program files. If you want to review or change any settings, click Back. If you are satisfied with the settings, click Next to begin copying files.
Current Settings:
Setup Type:
Complete
Target Folder
C:\Program Files\M3890D
User Information
Name: USB
Company: DMV
< Back
Next >
Cancel

10. Click [Finish] and the installation is complete.



Follow these steps to use the application program.

1. Connect the USB cable between the meter' s and the computer' s USB port.
2. Turn on the meter.
3. Click [Start], point to [Program] and [USB DMM].
4. Click [USBDMM] to run the application program.
5. In [Tool] popup menu, click [Config] to set configuration.
6. In [Tool] popup menu, click [Start]/[Stop] to run/stop the application program.

NOTE :

- To assist you for understanding the application program feature, read the ReadMe file before using the application program.

- Don' t disconnect the USB cable when operating the application program. Disconnect the USB cable after clicking [Stop] icon.

- Don' t excessively use the computer when operation the application program for the moderate operation of the application program.

8. CARE AND MAINTENANCE

8-1. Replacing the Fuse

WARNING : TO AVOID ELECTRIC SHOCK, DISCONNECT THE TEST LEADS BEFORE REMOVING THE BATTERY OR THE FUSE. REPLACE ONLY WITH THE SAME TYPE OF FUSE SPECIFIED. DO NOT REMOVE THE TOP COVER. THE SERVICE SHOULD BE PERFORMED ONLY BY QUALIFIED PERSONNEL.

CAUTION :
FOR CONTINUED PROTECTION AGAINST FIRE OR OTHER HAZARD, REPLACE ONLY WITH FUSE OF THE SPECIFIED VOLTAGE AND CURRENT RATINGS.

Follow these steps to replace the fuse.

1. Press the POWER push button to turn the power off and disconnect the test leads.

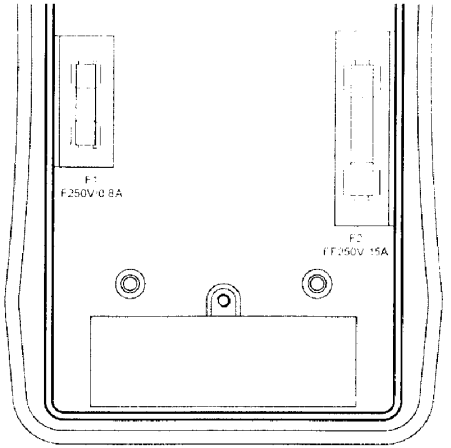
2. Remove the back cover by unscrewing the screws and pulling off the meter' s cover.

3. Remove the blown fuse.

4. Install the new fuse in the fuse compartment.

5. Replace the cover and secure it with the screws.

WARNING : DO NOT OPERATE YOUR METER UNTIL THE BACK COVER IS IN PLACE AND FULLY CLOSED.



8-2. General Maintenance

Any adjustment, maintenance or repair of the instrument except the battery and fuse replacement should be done only by qualified personnel.

1. Keep your meter dry. If it does get wet, wipe it dry immediately. Liquids might contain minerals that can corrode the electronic circuits.

2. Use and store your meter only in normal temperature environments. Extreme temperature can shorten the life of electronic devices, damage battery and distort or melt plastic parts.

3. Handle your meter gently and carefully. Dropping it can damage circuit boards and cases the meter to work improperly.

4. Keep your meter away from dust and dirt which can cause premature wear of parts.

5. Wipe your meter with a damp cloth occasionally to keep it looking new. Do not use harsh chemicals, cleaning solvents or strong detergent to clean the meter.

6. Use only a brand-new battery of the same size and type. Always remove an old or weak battery. It can leak chemicals that destroy electronic circuits. Modifying or tampering with your meter's internal components can cause a malfunction and might invalidate its warranty.

9. SPECIFICATIONS

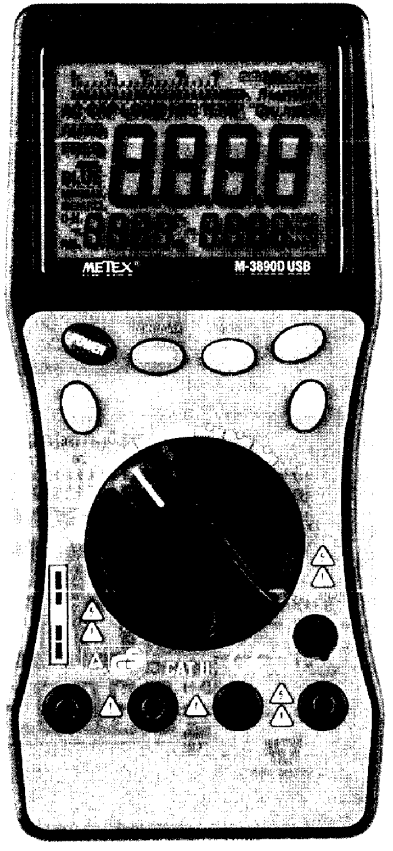
9-1. General Specifications

- Maximum Display ·····4000 counts(3 3/4 digit) with automatic polarity indication
- Max Input Current ·····DC & AC 20Amps
- Reading Time ·····3 ~ 4 readings per second
- Operating Temperature ·····0 to 40℃ (32 to 104°F)
- Storage temperature·····-10 to 50℃ (14 to 122°F)
- Temperature for·····23℃ ±5℃ (Guaranteed Accuracy)
- Battery Type ·····NEDA 1604 or 6F22 (one 9V battery)
- Size (H x W x L) ·····197mm x 89mm x 36.5mm
- Net Weight ·····360g ± 10g

9-2. Special Specifications

MODEL No.		M-3890D		
MEASUREMENT RANGES		ACCURACY		RESOLUTION
DC Voltage	400mV	± 0.5% ± 2dgts		100 uV
	4 V			1mV
	40 V	± 0.8% ± 2dgts		10mV
	400 V			100mV
	1000 V			1 V
AC Voltage	4 V	± 1.0% ± 3 dgts (40Hz ~ 500Hz)		1 mV
	40 V			10mV
	400 V			100mV
	750 V	± 1.5% ± 3 dgts (40Hz ~ 500Hz)		1 V
DC Current	4mA / 400 uA	±0.8% ± 2dgts		0.2 uA
	4mA			2 uA
	400mA / 40mA	± 1.2% ± 2dgts		20 uA
	400mA			200 uA
	20 A / 20 A	±2.0% ± 3dgts		2mA
AC Current	4mA / 400 uA	± 1.0% ± 5 dgts (40Hz ~ 500Hz)		0.2 uA
	4 mA			2 uA
	400mA / 40mA	±1.5% ± 5 dgts (40Hz ~ 500Hz)		20 uA
	400m			200 uA
	20 A / 20 A	± 3.0% ± 4 dgts (40Hz ~ 500Hz)		2mA
RESISTANCE	400 Ω	±0.8% ± 4dgts		0.1 Ω
	4 kΩ	±0.8% ± 2dgts		1 Ω
	40 kΩ			10 Ω
	400 kΩ			100 Ω
	4 MΩ	±1.0% ± 4dgts		1k Ω
	40 MΩ	±1.5% ± 5dgts		10k Ω
CAPACITANCE	4 nF	±2.0% ± 5dgts		1 pF
	40 nF			10 pF
	400 nF			100 pF
	4 uF	± 3.0% ± 5dgts		1 nF
	40 uF			10 nF
	200 uF	± 3.0% ± 5dgts		100 nF
FREQUENCY	4 kHz	± 0.1% ± 1dgt		1 Hz
	40kHz			10 Hz
	400 kHz			100 Hz
	4 MHz			1 kHz
TEMPERATURE		-40℃ ~ 200℃, ±3.0% ± 5dgts	200℃ ~ 1200℃ ±3.0% ± 2dgts	1 ℃
DIODE TEST		Test current max 1.5mA at 1kΩ (forward voltage max. 2V)		
CONTINUITY		Buzzer sounds of resistance less than80 Ω		
SIGNAL OUT		Generate C-MOS level signal with 13 steps of frequency		
TRANSISTOR(hFE)		Test current max. 1000uA		
LOGIC		Three Logic Level(Lo, ----, Hi)		

Triple-Display Auto-Ranging M-3890D



METEX® INSTRUMENTS